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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/748,227	12/27/2000	Toshiya Kotani	04329.2481	3533

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EXAMINER

PATEL, KANJIBHAI B

ART UNIT PAPER NUMBER

2625

DATE MAILED: 03/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/748,227

Applicant(s)

KOTANI ET AL.

Examiner

Kanji Patel

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4 is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2-3.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. Drawings filed on 12/27/00 have been approved by the examiner.

### ***Priority***

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Claim Objections***

3. Claims 5 and 8 are objected to because of the following informalities:

Claim 5, page 31, line 6, change "an" to --a--.

Claim 8, page 32, lines 7 and 15, change "an" to --a--.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 1-3 and 5-8** are rejected under 35 U.S.C. 102(e) as being anticipated by Yamamoto et al. (US 5,879,844).

The applied reference has a common assignee with the instant application.

Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art

under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

**For claim 1**, Yamamoto et al. disclose a mask pattern correction method used to form a desired pattern on a wafer by a projection optical system (at least a first embodiment, figure 14; column 8, lines 24-34; embodiments 2-7 also describe the similar features), comprising:

- the step of extracting a correction target edge from a mask design pattern (figure 16; column 16, lines 2-14);

- the step of calculating the distance from the correction target edge to a nearest edge of an adjacent pattern (figure 16; column 15 line 44 to column 16 line 23);

- the step of calculating the correction value according to pattern layout within a given range originated from the correction target edge by a simulation when the distance calculated in previous step is smaller than a given critical value (column 16, lines 15-37);

- the step of moving the correction target edge on the basis of the correction value calculated by the simulation (column 15 line 44 to column 16 line 37);

- the step of calculating the moving amount of the correction target edge on the basis of a correction value set as a rule in advance when the distance calculated in previous step is not smaller than the critical value (column 15 line 44 to column 16 line 14); and

the step of correcting the mask design pattern on the basis of the calculated moving amount (column 15 line 44 to column 16 line 14).

**For claim 2**, Yamamoto et al. disclose a method wherein the simulation uses a light intensity simulation technique (column 26, lines 64-67).

**For claim 3**, Yamamoto et al. disclose a method wherein the correction value set as a rule represents as a parameter at least one of a size of a pattern including the correction target edge, a distance between the correction target edge and a pattern adjacent to the correction target edge, and a size of the pattern adjacent to the correction target edge (figure 16; column 15 line 44 to column 16 line 23).

**For claim 5**, see the rejection of claim 1 above.

**For claim 6**, see the rejection of claim 2 above.

**For claim 7**, see the rejection of claim 3 above.

**For claim 8**, see the rejection of claim 1 above.

#### ***Allowable Subject Matter***

**5.** The following is a statement of reasons for the indication of allowable subject matter:

**Claim 4** is allowed because the prior art on record fails to teach or suggest, the second step of calculating correction value determined **two-dimensionally** by pattern layout around the correction target edge when the length of the correction target edge calculated in the previous step is smaller than a predetermined critical length, the distance calculation step of calculating a distance  $sp$  from the correction target edge to a nearest edge in the perpendicular direction, calculating a distance  $sh$  to a nearest

Art Unit: 2625

edge in the direction of length, the step of calculating the correction value by two-dimensional simulation according to pattern layout around the correction target edge, and moving the correction target edge on the basis of the calculated correction value when at least either one of the distances  $s_p$  and  $s_h$  calculated in the distance calculation step is smaller than a corresponding one of predetermined distances  $s_p'$  and  $s_h'$ ; and the step of moving the correction target edge on the basis of an edge moving amount set as a rule in advance using as a parameter at least one of the distances  $s_p$  and  $s_h$ , the line width  $W$  of the pattern containing the correction target edge, and line widths  $w_p$  and  $w_h$  of patterns adjacent to the correction target edge when the calculated distance  $s_p$  is not smaller than the critical distance  $s_p'$ , and the calculated distance  $s_h$  is not smaller than the critical distance  $s_h'$ .

#### **Other prior art cited**

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tsudaka (US 5,825,647) discloses a correction method and correction apparatus of mask pattern.

Taoka (US 6,350,977 B2) discloses pattern distortion detecting method and apparatus and recording medium for pattern distortion detection.

Tsuchiya et al. (US 5,475,766) disclose a pattern inspection apparatus with corner rounding of reference pattern data.

Kotani et al. (US 6,245,466 B1) disclose a mask pattern design method and a photomask.

Art Unit: 2625

**Contact information**

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Kanji Patel** whose telephone number is (703) 305-4011.

The examiner can normally be reached on Monday through Friday from 8:00 a.m. to 6:30 p.m. Friday off.

If attempts to reach the examiner by phone are unsuccessful, the examiner's supervisor, **Mehta, Bhavesh**, can be reached on (703) 308-5246.

Any inquiry of general nature or relating to the status of this application should be directed to the **Group receptionist** whose telephone number is (703) 305-3800.

The **Fax number** for this group is (703) 872-9306.



Kanji Patel  
Patent Examiner  
Group Art Unit 2625  
March 5, 2004